

Mergers and Acquisitions: A Financial Economics Perspective

by

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Abstract

In this paper, I begin by describing and assessing the different criteria simple criteria used by financial economists to evaluate merger success. I then discuss the empirical evidence on mergers and acquisitions in the corporate finance literature beginning with stock return studies, moving to accounting-based studies, and finishing with some discussion of clinical studies. Next, I discuss what these studies imply about the sources of gains and losses, and the factors that drive merger success. Finally, I discuss the potential implications of these findings for antitrust policies. Although it does not address antitrust concerns directly, taken as a whole, the financial economics literature does not provide much support for a more aggressive antitrust policy.

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1. Introduction

In this paper, I begin by describing and assessing the different criteria used by financial economists to evaluate merger success. I then discuss the empirical evidence on mergers and acquisitions in the corporate finance literature beginning with stock return studies, moving to accounting-based studies, and finishing with some discussion of clinical studies. Next, I discuss what these studies imply about the sources of gains and losses, and the factors that drive acquisition success. Finally, I discuss the implications of these findings for antitrust policy.

2. Evaluating Acquisition Success

Financial economists have used a number of measures to evaluate acquisition success. Probably the most common is the change in the company's value at the time of the announcement of the acquisition, generally 3 to 11 days. This attempts to measure the market's expectation of the change in value from the acquisition. Depending on the question, financial economists look at the change in value of the acquirer, the target, and the combined entity.

For the purpose of measuring the total economic impact of the acquisition, it is appropriate to use the combined change in value of both the acquirer and target. This is also the most appropriate measure for antitrust purposes. This point is often confused when business people, consultants and the business press discuss acquisition success. They tend to focus on the experience of the acquirer, concluding that an acquisition is not a good one if the acquirer loses value (i.e., overpays). This is correct from the perspective of the acquirer's shareholders, but irrelevant for shareholders overall (think of an index fund investor) and irrelevant from the perspective of evaluating the economic effect of the acquisition. Shareholders as a group and policy analysts should focus more on what happens to the combined value.

It is worth illustrating this point with a simple example. Take two companies, A and T, that are worth \$10 billion each. If A buys T, A will be able to get \$2 billion in synergies. A indeed decides to buy T, but agrees to pay \$15 billion. Upon announcement, T's value will increase by \$5 billion (or 50%)

from \$10 billion to \$15 billion. Upon announcement, B's value will decline by \$3 billion from \$10 billion to \$7 billion. Why the \$3 billion decline? B is paying \$15 billion for assets that will be worth \$12 billion (\$10 billion + \$2 billion in synergies). From the perspective of B's shareholders, B's executives, and B's consultants, B has made a bad acquisition, destroying \$3 billion. However, from the perspective of all shareholders, this is a very good acquisition. The combined value of A and B has increased from \$20 billion (\$10 + \$10) to \$22 billion (\$7 + \$15).

So one way financial economists measure the success or economic impact of an acquisition is to measure the combined change in value at the announcement. Under what circumstances is this an appropriate measure? The combined change in value is appropriate under two assumptions: (1) the market is well-informed about the value of the companies before the announcement; and (2) the only information released at the acquisition announcement is information about the acquisition. These conditions may or may not be satisfied.

To see this, consider the following:

Total changes in value after acquisition announcement:

$$= [A^A - A^0] + [T^A - T^0]$$

where, A^A / T^A = value of acquirer / target after the acquisition announcement.

A^0 / T^0 = value of acquirer / target before the acquisition announcement.

These can be further decomposed into:

$$= [A^A - A^N] + [A^N - A^0] + [T^A - T^N] + [T^N - T^0].$$

$$= [A^A - A^N] + [T^A - T^N] + [A^N - A^0] + [T^N - T^0].$$

where, A^N / T^N = value of acquirer / target after the acquisition announcement given new information about the acquirer and target, but not including any information about the acquisition.

The new terms can be decomposed into:

Total synergies:	$[A^A - A^N] + [T^A - T^N]$
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New information about Acquirer:	$[A^N - A^0]$
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New information about Target:	$[T^N - T^0]$
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In other words, the change in value at the acquisition announcement is the sum of (1) the market's estimate of the synergies in the acquisition and (2) the market's revaluation of the acquirer and target as standalone entities based on new information in the announcement. As a result, any particular acquisition announcement does not necessarily just pick up the synergies. In using the combined value change at the acquisition announcement to evaluate the economic value of a acquisition, financial economists assume either that there is no new information about the target and acquirer or, in a large sample study, that the new information is not biased in any one direction.

Market-efficiency skeptics will question whether announcement returns are meaningful. It is true that there is noise or measurement error in the announcement returns. And as shown above, the information released by the acquisition announcement is not solely about the value of acquisition itself. It is important to stress, however, that announcement returns do appear to be correlated with subsequent success or failure in a large sample of acquisitions (see Kaplan and Weisbach (1992), Mitchell and Lehn (1990), and Lehn and Zhao (forthcoming)). While the R-squared is not anywhere near one, the relations are positive and significant, suggesting that announcement returns provide useful information about acquisition success.

Financial economists also look at changes in value over the longer run, typically three to five years after the acquisition. The implicit assumptions in these studies are that (1) the acquisition is important enough to drive the combined company's stock price, and, again, (2) no other information is released or, alternatively, that there is no bias in the nature of other information that is released.

In addition to the stock market based studies, financial economists also use accounting-based studies. These involve looking at the change over time (usually one to five years) in some measure of earnings, cash flow, margins or productivity. The earnings-based studies use entity level financial statements while the productivity-based studies tend to use plant-level data. The implicit assumptions in these studies, again, are that the acquisition is important enough to drive the changes and that no other factors are important on average. The productivity-based studies at the plant level make the additional

implicit assumption that the productivity change of the acquisition is largely determined by productivity changes at the plant level.

The third type of study is to measure the actual or expected change in value of an acquisition by using the expected or actual changes in cash flows and values. Ex ante studies consider the expected changes in cash flows due to the acquisition, discounting them in some way, and coming up with a value. Ex post studies would consider all the changes in cash flows that actually happened (over some post-acquisition period) and attempt to value those changes.

These studies are generally informationally and computationally intensive. Studies that attempt to measure expected changes assume that the expected change they measure are, in fact, the actual expected changes. Studies that attempt to measure actual changes assume that it is possible to measure the actual changes caused by an acquisition.

There's one additional implicit assumption in all of the financial economics studies – the acquisition effects are exogenous and don't have an effect on acquiring companies. This is true because most measures of acquisition performance measure the combined company compared to other companies in the same industry. If the acquisition affects the behavior of non-acquiring companies, then performance relative to non-acquiring companies does not measure the true impact of the acquisition. This concern was probably relevant in the 1980s when acquisitions and hostile takeovers of particular companies arguably had large impacts on the behavior of companies that weren't taken over.

So, what can we conclude from all these different methodologies? The financial economics literature measures acquisition success using stock market values and measures of cash flow. The literature tends not to look at the effect on consumers or customers.

All of the measures are problematic in some way, relying on assumptions that may not be realized. All of the measures, however, are potentially informative. I have a preference for acquisition announcement returns as the most informative and cleanest about expected values. I would prefer measures of actual cash flow changes from acquisitions as an ex post measure of success, but they have proved very hard to calculate in a large sample setting.

3. Empirical Evidence

With all this in mind, this section provides my summary of much of the empirical work. Bruner (2004a and 2004b) provides another (and more detailed) take on the empirical work in financial economics on acquisitions.

3.1 Announcement Returns

The best paper on announcement returns (and the economics of acquisitions, in general) is Andrade, Mitchell and Stafford (2001). They look at all acquirers and targets in the merger and acquisition database of the University of Chicago Research and Security Prices database over a 25-year period. They first look at a three-day period around the announcement. They find that the combined announcement returns over that period are economically and statistically significant and positive. The combined values of the acquirer and target increase by 2% of the total initial value of the acquirer and target. This is equivalent to an increase that is roughly 10% of the initial value of the target alone. This result is consistent across all three decades, the '70s, the '80s and the '90s. Bruner (2000a) surveys a number of other papers and reaches the same conclusion.

The returns to the targets are clearly positive. The returns to acquirers are slightly negative, but not statistically different from zero. The combined returns are positive. If one were to judge acquisition success only by the acquirer return, one would conclude mistakenly that acquisitions did not create value on average.

If you use period that's longer and noisier – 20 days before the announcement until the acquisition closes – the combined returns are positive, but no longer statistically significant. Again, they are roughly 2 percent of the combined value, but because of the extra time, you get more noise. And again, the returns to targets are positive; the returns to acquirers, slightly negative, but not significant.

Now, recall from the earlier discussion that acquisitions may reveal new information about the acquirer and the target that is unrelated to the acquisition, but changes investor expectations. This is likely relevant for stock performance studies and potentially relevant for the accounting-based studies.

What kind of information is released when an acquisition is announced? An acquisition combines an investment decision and a financing decision. Theoretically and practically, an acquirer is more likely to use its stock to pay for an acquisition when the acquirer believes its stock is overvalued or fully valued. In practice, one might interpret an acquirer as believing its stock is overvalued when it says that it plans to use its stock as currency. Conversely, the acquirer is less likely to use equity when it believes its stock is undervalued. It is well-established that companies announcing equity financings (without an acquisition) experience stock declines at the issue announcement of roughly 3%.

This strongly suggests that the revision in the underlying value of the acquirer – $[A^N - A^0]$ – is negative when an acquirer uses equity to finance an acquisition. The measured combined returns in equity-financed acquisitions include $[A^N - A^0]$, and, therefore, likely underestimate the value of the acquisition. Because there is likely to be less new information in cash- or debt-financed acquisitions, the combined returns to those acquisitions are arguably a better measure of the average value of acquisition synergies. (Companies announcing debt financings typically experience no abnormal returns).

To account for the informational differences in equity- and non-equity- financed acquisitions, most studies look at those two types of acquisitions separately. Andrade et al. (2001) find that acquisitions funded by at least some stock have combined returns that are essentially zero. Acquisitions funded without stock have positive combined returns.

It also is worth mentioning a more recent paper, Moeller et al. (2005), that studies acquisitions through 2001. Moeller et al. find that both the average acquirer and combined returns for acquisitions in 1998 to 2001 were insignificantly different from 0. The total change in dollar value for both acquirers and the combinations are negative, driven by a relatively few large transactions with large declines in value. An unusually large percentage (over 70%) of the large loss deals are equity-financed.

To summarize, the bottom line of announcement return studies is that stockholders have viewed acquisitions as creating value on average. The combined returns are positive for non-stock acquisitions and neutral or slightly negative for stock-acquisitions. The combined returns from stock acquisitions are probably downwardly biased estimates of the economic value of the acquisition because they include negative information about the standalone value of the acquirer. Announcement returns are predictive of subsequent outcomes. The analyses are not particularly helpful regarding the source of gains or the determinants of success.

3.2. Longer Run Stock Return Studies

Andrade, Mitchell and Stafford (2001) also look at longer run returns, measuring the returns to acquirers for several years after the acquisition. The bottom line from these results is that the value-weighted post-acquisition returns to acquirers are slightly negative, but statistically indistinguishable from zero. Because they include the largest transactions, these represent the returns to those acquisitions that are most likely to receive regulatory scrutiny. Longer run returns to smaller acquirers – which drive the equal-weighted return results – appear to be negative. As with the announcement return studies, there is a difference between stock and non-stock acquisitions. Post-acquisition returns are (insignificantly) positive for acquisitions that are not equity-financed and (insignificantly) negative for acquisitions that are equity financed. Also like the announcement return studies, these analyses are not very helpful regarding the source of gains or the determinants of success.

3.3 Accounting-based Studies

As noted above, accounting-based studies use accounting-based measures (such as operating margins) and productivity-based measures (such as total factor productivity) to evaluate acquisition success. It is fair to say that results from these accounting-based studies are all over the map. Andrade, Mitchell, and Stafford (2001) and Healy, Palepu, and Ruback (1990) find positive results, i.e., accounting performance improves, although I would interpret their results as mixed. Maksimovic and Phillips

(2001), Kaplan and Weisbach (1992), McGuckin and Nguyen (1995), and Schoar find neutral or mixed results while Ravenscraft and Scherer (1987) find negative results. In other words, in contrast to the announcement return results, there is not clear-cut evidence that acquisitions lead to accounting-based or productivity-based improvements.

For example, Andrade, Mitchell and Stafford (2001) find that operating margins relative to the industry are about 3.2% after the acquisition versus 2.9% before. They do not report whether this difference is statistically significant, but it does not appear to be.

Healy, Palepu and Ruback (1992) are widely cited as finding positive increases in operating performance. The results are not so clear cut. They do not find any improvement or change in operating margins. Rather, they find that sales to the market value of assets increases after the acquisition. This result is difficult to interpret as an increase in operating performance.

Maksimovic and Phillips (2001) and Schoar (2002) use the Longitudinal Research Database (LRD). Schoar (2002) finds that diversified firms are more efficient than stand-alone firms. Plants that are acquired experience an increase in productivity with the increase being driven by diversified acquirers. While diversifying acquirers drive productivity increases in acquired plants their existing plants decline in productivity. The net effect is a decline in productivity in diversifying acquisitions.

The bottom line of the accounting studies is that there is no clear relation on average between acquisitions and subsequent accounting or productivity performance. It is something of a puzzle in relation to the event study results. The likely explanation is that the accounting data are too noisy to isolate the effects of the acquisition. This is plausible given the transformations the accounts of the merging firms go through at the merger (restatements, special amortization and depreciation, merger-related costs, etc.).

3.4 Clinical Studies

In contrast to large sample studies, clinical studies such as those in Kaplan (2000) look at individual acquisitions (or a small number) and attempt to estimate the effects of those acquisitions

directly. For example, Kaplan, Mitchell and Wruck (2000) calculate the annual cash flows and the value at divestiture of an acquisition. They compare the discounted value of the cash flows and divestiture to the pre-acquisition value. This provides a blueprint for doing this type of calculation. The analysis for that particular case also comes up with a different answer than the accounting study analysis consistent with a great deal of noise in the accounting study approach.

4. Sources of Gains and Losses

The studies discussed to this point measure the average effect of acquisitions. Aside from the effect of the form of financing, they do not attempt to explain the determinants of gains or losses. A number of studies have studied the cross-sectional determinants of value changes in acquisitions.

Perhaps the most interesting along these lines is Houston, James and Ryngaert (2001) who study 41 large bank acquisitions. They compare the announcement returns of the acquisitions to the cost savings and revenue increases projected by the acquiring banks at the announcement of the acquisition. They find that the combined announcement returns are significantly related to the projected cost savings, but not related to the projected revenue increases. Every \$1 in value of projected cost savings is associated with \$0.58 in increased value of the combined companies. (The revenue result suggests no evidence of market power although the banks might decide not to project market-power related revenue increases.)

There have been many papers that have studied related versus unrelated acquisitions, looking at announcement returns, accounting performance, and Tobin's Q. Surprisingly, the evidence here is also mixed. Some studies find a more positive reaction to related acquisitions. Many studies – e.g., Berger and Ofek (1995), Chevalier (1999), Graham et al. (2000), Lang and Stulz (1994), Villalonga (2001), find that diversified firms trade at a discount to stand-alone firms, however at least part of the discount, if not all, appears to be selection driven. I.e., firms that do not have good opportunities within their base industry are more likely to diversify. As noted above, Schoar (2002) finds that diversifying acquisitions are associated with increases in acquired plant productivity, but decreases in existing plant productivity.

Masulis et al. (2005) find evidence that acquirer returns are modestly higher in firms with better governance (as measured by protection from takeover).

More recently some papers have argued that acquisition activity is driven by equity market mispricing. Shleifer and Vishny (2003) argue that overvalued acquirers use overvalued stock to buy targets. Informed acquirer management / shareholders benefit by issuing overvalued stock to uninformed. Informed target management / shareholders sell while acquirer shares remain overvalued. According to this theory, the true overall value impact is neutral. Jensen (2004) makes a related argument, claiming that CEOs of companies with overvalued stock use that stock to make acquisitions in order to justify the high stock price. Those acquisitions turn out to be value-destroying. The evidence for these theories is mixed. The results in Moeller et al. (2005) for the large loss acquisitions can be construed as being consistent with these behavioral theories, particularly Jensen's. The results in Andrade et al. (2001) and Lehn and Zhao (2005) are less so.

Finally, there have been a number of large sample studies that test for the existence of market power in explaining acquisition gains. For the most part, these studies find no evidence for market power. Older studies include Eckbo (1983 and 1992) and Stillman (1983). Eckbo (1983) studies the stock market reactions to merging companies and their rivals to announcements of horizontal mergers. He finds that rivals experience a positive return at the merger announcement. This is consistent with market power – i.e., higher future prices for customers in the industry – but also with efficiency gains in the form of positive information about future efficiency gains for the other companies in the industry. Eckbo then looks at the reaction of rivals to antitrust challenges to the mergers. The market power hypothesis would predict a negative reaction on rivals – i.e., prices will not be increasing – while the efficiency gain hypothesis would predict no reaction on rivals. Eckbo does not find a negative reaction.

More recently, Fee and Thomas (2004) and Shahrur (2005) undertake detailed and carefully done studies that examine the announcement returns of competitors, suppliers, and customers of firms in horizontal mergers. If mergers lead to increased collusion and prices, competitors should be helped and

customers hurt. If mergers lead to increased buyer power in the form of monopsony rents, suppliers should be hurt.

Fee and Thomas also look at the announcement returns of antitrust challenges as well as post-merger operating performance. Similar to Eckbo (1983), Fee and Thomas do not find negative returns to competitors when mergers are challenged on antitrust grounds. Fee and Thomas also find that customers experience insignificant stock market reactions and changes in operating performance. These results are not supportive of market power with regard to customers. Fee and Thomas do find some evidence that suppliers are hurt by horizontal mergers. Suppliers experience negative announcement returns and negative changes in operating performance. These negative effects appear to be driven by suppliers who subsequently lose business with the merged companies. As with the results for rivals and customers, this is more consistent with efficiency gains than with any monopsony or market power. Overall, like the earlier work, Fee and Thomas (2004) find no systematic evidence that market power / collusion explains merger gains.

Shahrur (2005) obtains broadly similar results, finding little evidence that market power is important. Combined returns to the acquisitions in his sample are positively correlated with returns to competitors, suppliers, and customers. This is not consistent with the collusion / market power nor with buyer power / monopsony. He finds no evidence of any adverse impact on customers. He finds some evidence suggestive of suppliers being adversely affected by the increased buying power of the merged companies in concentrated industries.

Fridolfsson and Stennek (2000) criticize event studies as being potentially unable to pick up anti-competitive effects in mergers. They try to explain why a merger could be anti-competitive even if competitor stock prices fall. This makes the paper both poorly motivated and confusing. It does not appear to be a relevant criticism of the studies described above. Most event studies – including the ones described above find a positive stock price effect on competitors. This is consistent with efficiency gains and with market power explanations. It is the evidence on customer and supplier returns as well as competitor returns around regulatory challenges that casts doubt on the claim that mergers are

anticompetitive. The paper is not consistent with the results on operating performance in Fee and Thomas (2004).

The discussion here is relatively terse because (with the exception of Houston et al. (2001)) the large sample evidence is relatively sparse on the detailed determinants of success. Large sample evidence in Mitchell and Mulherin (1996) and Andrade et al. (2001) suggest that mergers are driven by technological and regulatory change. The clinical studies in Kaplan (2000) and Bower (2001) are consistent with this. The clinical studies as well as consulting based studies suggest that acquisitions are more likely to be successful when the acquirer (1) has a deep understanding of target firm's business (which is likely correlated with related versus diversifying acquisitions); (2) imposes an organization design and organizational structures that are appropriate for the acquired business; and (3) introduces appropriate compensation systems and incentives. These three factors seem to be clearly associated with efficiency gains and less so with market power.

5 Possible Implications For Antitrust

The Commission and this Roundtable are interested in understanding whether “the economic evidence provides a basis for making merger policy more or less aggressive than it currently is.” A case for more aggressive merger policy presumably could be made if mergers systematically lead to increased prices, less innovation, lower quality and other harm to consumers. Taken as a whole, I do not think the literature provides much support for a more aggressive antitrust policy. If anything, the evidence might suggest a less aggressive one.

First, the announcement return studies – Eckbo (1983), Fee and Thomas (2004), etc. – that have looked for antitrust related problems using competitor, customer, and supplier stock returns typically have found little adverse evidence. (This is particularly striking since researchers presumably have a strong publication incentive to find such effects -- i.e., if a paper found such an effect, the paper would be very attractive to academic journals.) The announcement return studies are given extra credibility by the fact that post-merger operating performance appears to be consistent / correlated with those returns. These

results strongly suggest that existing merger policy is successful on average in deterring antitrust-related problems. The results also raise the question of whether a less aggressive antitrust policy would be desirable.

Second, the evidence in the accounting-based and clinical studies cited above suggests that gains from cost cutting / efficiency gains are more prevalent and more greatly valued by the stock market than gains from revenue growth.

Third, the evidence from productivity-based studies – particularly Schoar (2002) – suggests that plant-level productivity improvements are greater in diversifying acquisitions. While this is not exactly the correct test, if antitrust concerns were important, one would expect the opposite.

Fourth, the evidence in Moeller et al. (2004) suggests that announcement returns to merging companies are more negative in larger deals. This is the opposite of the result one might expect if antitrust concerns were important. I.e., larger deals should lead to greater increases in concentration (on average), greater price increases, and greater value for the merging companies.

6. Conclusion

In this paper, I describe and assess the different criteria simple criteria used by financial economists to evaluate merger success. I then discuss the empirical evidence on mergers and acquisitions in the corporate finance literature beginning with stock return studies, moving to accounting-based studies, and finishing with some discussion of clinical studies.

Although the evidence is not uniform, on balance I would conclude that acquisitions do create value. I rely on the announcement returns as the critical evidence. They have been reliably positive over the last 30 years, particularly for acquisitions that are cash financed. Acquisitions using stock are value neutral, but likely include a negative information component about the stand-alone firms. It is clear that shareholders of targets gain, while shareholders of acquirers experience mixed results.

The accounting-based studies are more mixed, but are subject to more noise. The accounting-based studies also would be less likely to pick up performance changes in acquisitions driven by

technological and regulatory change. Mitchell and Mulherin (1996) find that a large fraction of acquisition activity is driven by such change.

Some large sample studies as well as clinical studies suggest that cost cutting is a greater driver of acquisition success and value creation than revenue growth or market power. It also seems likely that a deep understanding of the acquired business, appropriate organizational design and structures, and appropriate compensation system and incentives improve the likelihood of success.

Taken as a whole, the financial economics literature provides little, if any support for a more aggressive antitrust policy.

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